



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

**CALCULUS.**

126. Proposed by JOHN M. COLAW, A. M., Monterey, Va.

Find the volume contained between the conical surface whose equation is  $z=a-\sqrt{x^2+y^2}$ , and the planes whose equations are  $x=z$  and  $x=0$  by the formula  $\iiint dx dy dz$ . [*Todhunter's Integral Calculus.*]

127. Proposed by J. A. CALDERHEAD, B.Sc., Professor of Mathematics, Curry University, Pittsburg, Pa.

Find the moment of inertia of a parallelogram about an axis perpendicular to its plane and passing through the intersection of its diagonals.

\* \* \* Solutions of these problems should be sent to J. M. Colaw not later than May 10.

**MECHANICS.**

115. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

A vessel in the shape of a parallelopiped, filled with water, has in its horizontal bottom a rectangular opening, whose dimensions are  $a$  and  $b$ , which is shut up by a slider. Supposing this slider to be opened with a uniform motion in the direction of  $a$ . To find the depth of the water in the vessel after the time  $T$  at the moment when the slider has passed through the space  $a$ ,  $a$  denoting the horizontal section of the water in the vessel.

116. Proposed by C. L. CHILTON, Greensboro, Ala.

Given, the shaft  $ABC$  attached at one end by a pivot to the piston-rod of an engine (at  $A$ ) and the other to the crank of a wheel  $CDE$  (at  $C$ ). The shaft moves through the distance of two feet in one second from  $A$  to  $B$  and at the same time turns the crank from  $C$  to  $E$ . The force propelling the shaft along the constrained course from  $A$  to  $B$  is 5780 pounds. The mass of the rod and wheel and friction being not considered, what would be the kinetic energy of the machine? or the sum of the moment around  $O$ , the center of the wheel?

117. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in Irving College Mechanicsburg, Pa.

How much lower must *one end* of a heavy uniform chain, wound round the circumference of a perfectly rough vertical wheel, hang than *the other end*, when the chain is on the point of motion?

118. Proposed by M. E. ANDERSON, Minneapolis, Minn.

A closed steel cylinder of length  $L$  and diameter  $D$  is placed in a horizontal position. The cylinder is filled with water to a depth ( $a$ ) from the lower side, the space above the water being filled with air at a pressure  $P_1$ .

What work will be done against this increasing pressure, and against gravity, by a pump forcing water into this tank until the pressure has increased to  $P_2$ ? Suppose the level of the water in the tank at the beginning to be the same as that of the reservoir from which the water is pumped.

\* \* \* Solutions of these problems should be sent to B. F. Finkel not later than May 10.